ISSUE BRIEF

FROM MSCI ESG RESEARCH LLC

2017 ESG TRENDS TO WATCH

Linda-Eling Lee, Matt Moscardi

January 2017

This year may usher in a fundamental rethink for investors. Underlying all the major trends we identified for 2017 is a strategic decision point – do we change the way we think about investing, or is this business as usual in a new order?

In either case, one thing seems certain – focusing on policy shifts alone would be shortsighted. Policy is an outcome, forged by forces that unfold over more than one election cycle and reflect deeper technological, socio-demographic and energy trends that are reshuffling the social order and the investment landscape. This year, we need to think big – how will major trends affect the capital markets for the next decade? Here are the biggest ESG forces affecting institutional investors over the long haul.

KEY 2017 TRENDS

1. **Owning the Long Game**
   In 2017, some of the world's largest investors may differentiate themselves by gearing toward the long view as globalization and technological advancements have strained social cohesion and fanned populist sentiment.

2. **The Shift from Regulatory to Physical Risk**
   Focus on policy uncertainty around climate change in the wake of the U.S. election is misplaced. In 2017, we believe investors will turn their attention to mitigating exposure to the physical risks from climate change, especially the encroaching scarcity of water in regions that range from the Middle East to the US.

3. **Choosing Stewardship in Asian Capital Markets**
   Rapid adoption of codes that promote engagement between companies in Asia and investors may be upending the conventional wisdom that Asia lags global peers in corporate governance. In 2017, the real work starts, with investors facing a choice between paying lip service to influencing companies' behavior and pushing for the change that stewardship brings.

4. **ESG Investing as a Precision Tool**
   Research that points to ESG factors as a performance indicator continues to grow. In 2017, institutional investors may apply more differentiated and targeted strategies to integrate ESG signals across asset classes, markets and factor exposures.

5. **Adoption of a New Performance Language**
   The U.N. Sustainable Development Goals are becoming a de facto framework for bringing together investors, companies, governments and citizens with the aim of protecting the planet, ending poverty and promoting peace and prosperity. In 2017, we see the increased adoption of corporate disclosures targeting these goals as a boost for institutions that aim to broaden their programs for investing with impact.

6. **Green Shoots in China and India's Sustainable Finance**
   The surge of innovation in sustainable development projects and initiatives in China, India and other emerging markets has been greeted with equal parts optimism and skepticism by institutional investors. In 2017, domestic and global standards will likely converge as companies in these markets deepen their understanding of standards required to attract foreign capital.

OWNING THE LONG GAME

The outset of 2017 marks an inflection point for institutions that purport to invest for the long term. Globalization and technological progress have produced both prosperity and inequality over many decades.[1] Since the global financial crisis, a growing chorus of investors and policymakers has railed against short-termism and advocated taking a long view.[2] With more upcoming elections showing potential signs of populist political shifts, the temptation will be to react and over-react to spasms in the Twittersphere. But what 2016 taught us is that it's the slow-burning risks that can matter the most.

Exogenous risk, like regulatory shifts or a rise in sea levels, can be a source of excess return for institutional investors as companies position themselves to innovate and adapt – or see their business models vanish. For a universal, long-term investor,[3] however, all risk is endogenous. Consider corporate tax payments, which perennially garner headlines when companies fail to pay their "fair share" of taxes. While corporations can, at a firm level, reap rewards from tax arbitrage, the wholesale impact includes gaps in funding for needs such as infrastructure and health care, while raising the risk of regime change that can upend the competitive dynamics and profitability of entire sectors. Long-term investors cannot afford to collect the short-term gains at the expense of crumbling infrastructure. They own both outcomes.

In recent years, long-term institutional investors have started to manage these economy-wide risks through collaborative engagements that aim to shore up market standards in areas ranging from corporate governance to climate risk.[4]

[1] See for example Autor, Dorn & Hanson. 2013. NBER Working Paper. "Untangling Trade and Technology: Evidence from Local Labor Markets" and Chandy & Dervis. 2016. Brookings. "11 Global Debates: Are Technology and Globalization Destined to Drive Up Inequality."

[2] See, for example, "The Kay Review of UK Equity Markets and Long-Term Decision Making." Also Haldane, 2015. Speech at University of Edinburgh Corporate Finance Conference. "Who Owns a Company?"

[3] "Universal owners" include large institutional investors such as pension funds, sovereign wealth funds and endowments – that are large enough to own every asset class and thus be exposed to the entire market. They typically have liabilities that stretch decades. See for example Hawley and Williams. 2006. *The Rise of Fiduciary Capitalism: How Institutional Investors Can Make Corporate America More Democratic.*

[4] We highlighted an increase in what we have called a beta engagement strategy in our 2016 ESG Trends to Watch. In order to shift the market – in effect, "manage" their beta, some institutional investors are taking on issues wholesale as a complement to their traditional approach of engaging one company at a time. The movement to bring shareholders in the U.S. a right of proxy access enjoyed already by investors throughout Europe is the most prominent and successful example to date of "beta engagement." Another example is a campaign led by the Coalition for Environmentally Responsible Economies (CERES) that focuses on the filing of

Some are ready to go further and position themselves differently from a market dominated by short-termism. We see two approaches on the horizon.

The first is an investment policy shift that emphasizes the long term by adopting benchmarks that explicitly incorporate views of the future. While market capitalization-weighted benchmarks best reflect today's market value and opportunity set, long-term investors currently lack a way to proactively assert their beliefs about how markets will look years from now as risks from climate change or social inequality are eventually priced by the market. While the differences may be subtle, entailing, for example, a slight tilt towards more resilient assets, a shift from "reflect" to "assert" may allow institutional investors to look beyond blind spots that can come with a focus on the short term.

If the first approach is a change in policy, the second is a change in action. Buoyed by a slew of research since the financial crisis that focuses on a mismatch of incentives,[5] long-term investors are more likely to focus on generating excess return through strategies that aim to assemble a portfolio of so-called high-conviction picks[6] with limited turnover.

An example of this type of long term approach, some research published in 2016[7] highlighted how fundamental metrics, such as dividend growth, contributed more to active returns as time horizon was lengthened. Additionally, the value leakage that a misalignment of incentives, a lack of accountability, or exposure to long-term risks such as climate change can produce lends to a strategy that emphasizes vigilance and influence; in short, for investing with the mindset of an owner rather than a trader.

The year ahead has the potential to test institutions and portfolio companies that espouse a long-term orientation. The temptation to time the market in response to

---

resolutions that urge fossil-fuel-based companies to stress test their business strategies in a scenario of where global warming is limited to 2º Celsius

[5] See for example Investment Leaders Group. 2016. "Taking the Long View: A Toolkit for Long-Term Sustainable Investment Mandate; Focusing Capital on the Long Term." 2015. "Long Term Portfolio Guide"; Center for International Finance and Regulation Research Working Paper Series. 2014. "Benefits (and Pitfalls) of Long Term Investing," "Long-Term Investing: What Determines Investment Horizon?"

[6] See for example Universities Superannuation Scheme's move towards a "high conviction" equity portfolio. "USS creates head of research role to support high-conviction equity shift." (2016). Investments & Pensions Europe.

[7] Global Market Returns as of March 2016; Government of Norway https://www.regjeringen.no/contentassets/f353169233704a55b3af6b0b36fb3129/global_markets_returns_3_04_16.pdf

(or in anticipation of) events – real or rumored – could prove too powerful a distraction for many. But for investors committed to the long term, 2017 may be the year to differentiate themselves from the pack and orient towards future decades.

THE SHIFT FROM REGULATORY TO PHYSICAL RISK

Even as institutional investors worry that political and regulatory shifts will thwart efforts to slow climate change, companies face a much starker reality: The planet does not care about politics. Physical risk, not regulatory risk, is the exposure that companies may need to worry about.

This is a reality the insurance sector has known for years. Large swaths of homeowners in the U.S., for example, moved to government subsidized insurance because private insurers would no longer bear the risks of an increase in the intensity of storms or the rise of sea levels on their own.[8] With the first six months of 2016 marking the warmest half-year on record[9], 2017 could mark the year that investors protect their portfolios against climate risk like insurers to price physical risk in premiums. The question is how.

A natural starting point is to measure risk at a physical level. Take, for example, water. For companies, risk from water takes two forms: how much they need water, and where they can get it. Now consider two utilities – Fortum, based in Finland, and Xcel Energy, based in the U.S. In 2016, both companies needed water to generate power, with intensities at more than 130,000 cubic meters for every USD 1 million in revenue (as of June 30, 2016), compared with, for example, a services company that used as little as 10 cubic meters to generate the same sales.

While both Fortum and Xcel need the same amount of water to produce power, they face physical limitations. Fortum draws water from basins throughout Scandinavia and Russia, where the resource is plentiful. Xcel, on the other hand, operates solely in states such as Texas and Colorado that continually face shortages and where competition for water has the potential to intensify over time.

A similar tension exists in portfolios. Consider two U.S. funds that have the same investment objective: Invesco's PowerShares High Yield Equity Dividend Achievers Portfolio (PEY) and the iShares Core High Dividend ETF (HDV). On average, holdings in these funds demand roughly 48,000 cubic meters of water per dollar of sales to operate, ranking both in the top 10% of all funds in our coverage (as of June 30, 2016)[10].

---

[8] http://grist.org/cities/flood-pressure-how-climate-disasters-put-femas-flood-insurance-program-underwater/

[9] http://climate.nasa.gov/vital-signs/global-temperature/

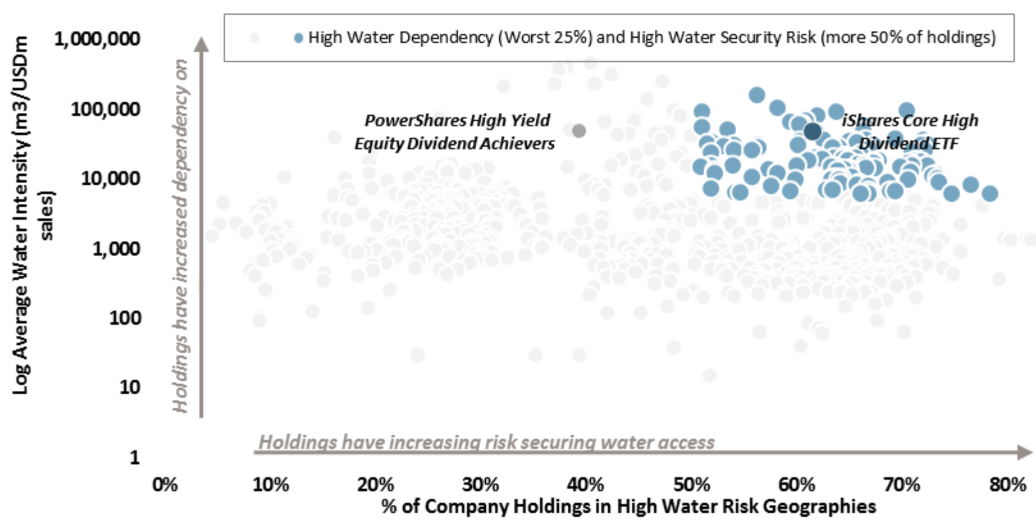
[10] Includes 849 US Equity funds covered by Lipper and in which we have 60% coverage for ESG Ratings, consist of at least 10 holdings, have updated data in the 12 months prior to June 2016, and are at least USD 500m in NAV. https://www.msci.com/www/research-paper/fund-transparency-exploring-the/0313270635

While that may be expected from dividend funds, which historically have had high allocations to utilities[11], the two funds face very different levels of water security. For PEY, the share of corporate assets located in regions with high water stress accounted for 39% of total fund assets. For HDV, the allocation to high-risk regions reached 62% as of June 2016, which reflected weight placed on companies such as Xcel Energy, Alliant Energy and WEC Energy Group — all heavily dependent on water compared peers and all of which operate primarily in states – Texas, Wisconsin, and Colorado – that tend toward droughts.[12]

The pressure from scarce water supply is not limited to water-intensive businesses. Reliance on water by companies in the agricultural sector can alter the risk profile of a fund dramatically. Portfolio companies held by the Schwab US Dividend Equity ETF as of June 2016 required less than 6,000 cubic meters of water per dollar of sales to operate, but those same companies required an additional 42,000 cubic meters of water *inputs* to generate those sales.

In 2017, institutional investors may begin to build portfolios that aim to protect against physical risks that transcend political regimes. While water scarcity may be a starting point, investors broadly are more likely think like insurers in protecting their assets in the coming years.

Figure 2: Measuring Water Dependency and Security in US Equity Fund Holdings, June 2016



Source: MSCI ESG Research, June 2016, WRI Aquaduct

[11] Why do utility stocks pay high dividends?, Investopedia; http://www.investopedia.com/ask/answers/122214/why-do-utility-stocks-pay-high-dividends.asp

[12] http://www.wri.org/resources/data-sets/aqueduct-global-maps-21-data

CHOOSING STEWARDSHIP IN ASIAN CAPITAL MARKETS

Conventional wisdom is that markets in Asia lag those in Europe when it comes to sustainable investing or engagement between investors and the management of companies in which they invest. Change may be afoot. Six of the 14 countries globally that developed stewardship codes since 2014 are in Asia according to the Principles for Responsible Investment.[13] The codes, which have typically been modeled after the U.K. Stewardship Code, set out principles that aim to improve engagement between investors and companies to help improve long-term, risk-adjusted returns.

If espousing codes and principles was the easy part, the hard part starts in 2017. As Asian institutional investors explore what it means to be active owners in promoting sustainable growth, they will increasingly face two challenges: the challenge of short- vs. long-termism, and the structural social and environmental challenges specific to each Asian market.

Japan, as the market that has perhaps traveled the furthest in the past two years, illustrates the point as it may soon stand at a crossroads. Early evidence from Japan[14] suggests that the relationship between investors and companies is evolving. In a survey[2] conducted by Japan's Government Pension Investment Fund (GPIF), the world's largest with USD 1.2 trillion in assets as of December 31, 2015[15], slightly more than 60% of the fund's companies reported changes in their interactions with GPIF's external managers.

However, tension between the short-term compliance mentality of many companies and investment managers versus the long-term goals of asset owners remains. While almost two-thirds of the companies characterized the changes as positive, a significant minority surveyed noted an uptick in "stereotypical" questions,[16] presumably reflecting the questions of investors who view the activity as a formality.

---

[13] Principles for Responsible Investment. (2016). "The Global Guide to Responsible Investment Regulation." [We also have a link to the report on our website: https://www.msci.com/esg-integration]

[14] More than three quarters of companies report compliance with all or most of Japan's Corporate Governance Code, which was introduced on June 1, 2015. Separately, the number of signatories to Japan's Stewardship Code grew to 213 asset owners and investment managers, as of September 2016, up from 122 in May 2014

[15] http://www.pionline.com/gallery/20160907/SLIDESHOW2/907009999/10

[16]Summary Report of Stewardship Activities, GPIF, April 2016 http://www.gpif.go.jp/en/topics/pdf/20160407_summary_report_of_stewardship_activities_en.pdf

Evidence suggests that short-termism may be winning. The volume of share repurchases among Japanese companies has increased to JPY 5.1 million as of September 2016, up 24% from June 2015, suggesting pressure on companies to raise returns on equity. In Japan as elsewhere, asset owners who aim to promote sustainable growth over the long term have few means to differentiate among investment managers who view engagement as something to be checked off a to-do list, and those who invest time and expertise to align interests of management toward improving business quality and resilience to risk over the long term.

Investors who espouse stewardship in Asia also face the challenge of tackling structural, macroeconomic issues, including, in Japan, an impending scarcity of human capital. With a labor force that is projected to shrink by 12% in the next 10 years,[17] Japan lags globally in terms of the number of women in the labor force[18]as well as the number of who hold positions in executive management or serve as directors.

Research by MSCI finds that female representation in management positions in Japan was as low as 2% in sectors such as energy and materials, as of July 2016.[19] Impediments to women in the workforce, including a shortage of child care, and a tendency in Japan toward overwork, also pose problems for maximizing the collective talent pool. Institutional investors are starting to notice. The Bank of Japan (BOJ), for example, seeded the creation of five exchange-traded funds in 2016 that aim specifically to invest in companies with plans to invest in physical and human capital.[20][21]

Investors in Japan find themselves challenged on whether to view stewardship as a formality or to view it as a shift in their engagement practices with companies to help create value over the long term.

[17] Cabinet Public Relations Office, Cabinet Secretariat, Information release on the Japan's Plan for Dynamic engagement of All Citizens (October 16, 2015, last updated August 2, 2016)

[18] 81.8% of men vs 64.6% of women in 2015; Labour Force Survey (2015), Statistics Bureau, Ministry of Internal Affairs and Communications

[19] "Measuring the sustainability of Abenomics-Japan Report 2016" by MSCI ESG Research, September 2016

[20] "Statement on Monetary Policy" by Bank of Japan, December 18, 2015. English Document here; Establishment of "Special Rules for Purchases of ETFs to Support Firms Proactively Investing in Physical and Human Capital, Bank of Japan, 15 March 2016. English Document here.

[21] The Daiwa ETF MSCI Japan Human and Physical Investment Index is the largest investment which tilts towards companies with stronger labor management practices (greater training, diversity and employee engagement than sector peers) as well as financial quality characteristics.

Japan is not alone in this. Taiwan, Malaysia and Hong Kong all have adopted stewardship codes that put the concept of active ownership on investors' agendas.[22] Taiwan's Bureau of Labor Funds, which oversaw USD 46.7 billion in investments as of July 2016,[23] recently committed USD 2.4 billion to socially responsible investments.[24] Companies are anticipating such shifts. Among Asia Pacific companies (ex-Australia and New Zealand) that were included in the MSCI ACWI Index as of June 2016, roughly 22% contacted the MSCI ESG Research group in 2016 to ask questions or provide information that related to ESG assessments, up from 8% two years earlier.[25]

While a change in mind-set among institutional investors and companies may take years, 2017 should be a year of ferment and discovery across Asia about what it takes to create value sustainably over the long term.

[22] South Korea opened a consultation on its stewardship code draft to investors in 2016; https://www.hermes-investment.com/ukw/blog/eos-articles/conquering-the-world-the-success-of-stewardship-codes/.

[23] Pensions & Investments, July 2016; http://www.pionline.com/article/20160415/ONLINE/160419905/taiwans-bureau-of-labor-funds-hires-7-to-manage-53-billion

[24] Plans for 2017 Mandate Programs of the Bureau of Labor Funds, 2 December 2016. English Document here

[25] Thirty-two percent of the 550 companies in MSCI's Japan coverage universe for ESG Ratings provided such feedback in 2016, an increase from 8% in 2014.

ESG INVESTING AS A PRECISION TOOL

2017 may be the year that ESG grows up. A series of research papers published in 2016 extolled the virtues embedded in ESG signals. The findings differed from many of those published previously in that they shifted the conversation from *how* ESG matters (answering the "ESG or performance" question) to *where* it matters.

The shift played out repeatedly. Cambridge Associates found that ESG made a stronger contribution to performance of companies in emerging markets than those in developed markets.[26] If this seems intuitive, it's because it is. Investors in emerging market companies have traditionally had less information about the companies they invest in compared with their peers in developed markets, and investors naturally give greater weight to a holistic view of the company. Research by Barclays found that governance factors could be linked to credit performance. Again, this fills a natural investment thesis – strong management quality is likely to result in greater fiscal responsibility and fewer credit downgrades. Both studies show that ESG signals are nuanced, and selective application may be more effective than a blanket approach.

Factor investing fits neatly into this conversation. While many institutional investors rely on factors to determine how much of a portfolio's return reflected market exposures and how much resulted from active choice, factors have been increasingly used to systematize investment in "smart beta" strategies.

Now we're learning that ESG signals and factor exposures have a relationship, and that relationship can either enhance or interfere with investment goals. For instance, MSCI has found that ESG can complement some defensive strategies that focus on lower volatility or higher quality companies.[27] Boosting the overall ESG profile of the sample portfolio used in the study by between 20% and 30%, for example, entailed relatively modest tradeoffs from the overall targeting of quality factors while improving returns over the period between December 2007 and June 2016. Conversely, increasing the ESG profile by 20% or 30% in a sample strategy targeting momentum caused a minor drop in risk-adjusted performance but caused

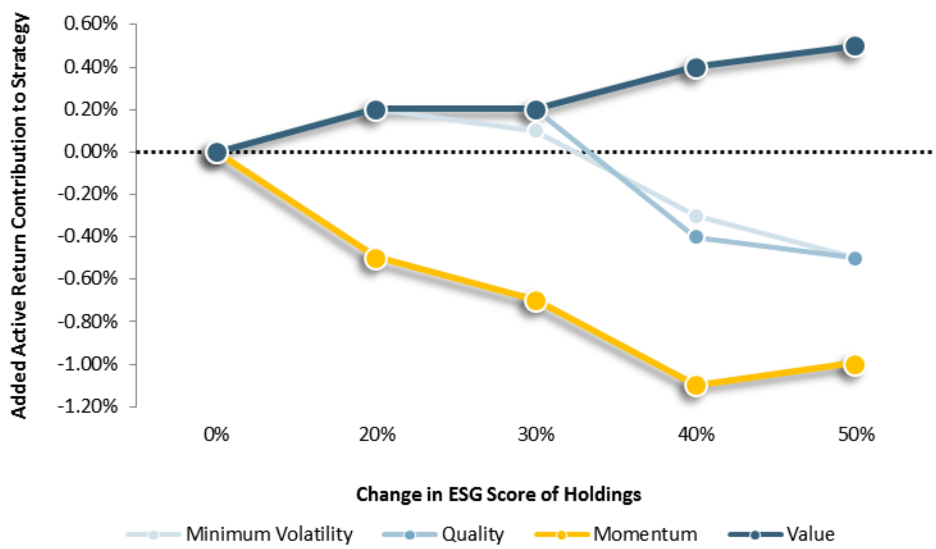
[26] This finding corroborates the historical performance differences between the MSCI Emerging Markets ESG Index and the MSCI World ESG Index, which is composed of constituents in developed markets. For the nine years ended Dec. 31, 2016, the MSCI Emerging Markets ESG Index has experienced annualized returns that are 4.23% percentage points above its benchmark, the MSCI Emerging Markets Index. Over the same period, MSCI's World ESG Index achieved annualized returns of 0.01% 1 percentage point above its benchmark. https://40926u2govf9kuqen1ndit018su-wpengine.netdna-ssl.com/wp-content/uploads/2016/11/The-Value-of-ESG-Data-Early-Evidence-for-Emerging-Markets-Equities.pdf

[27] Melas, D., Z. Nagy and P. Kulkarni. (2016). "Factor Investing and ESG Integration." MSCI Research Insight.

a 13.3% drop in the sample strategy's exposure to the momentum factor over the same 9.5-year period. Effectively, adding ESG characteristics to a momentum strategy made for a more difficult marriage.

Throughout 2016, investors deepened their knowledge of the nuances in ESG data.[28] In 2017, we anticipate the conversation shifting from "how" to use ESG to "where" to use ESG, one that will manifest in diverse applications in portfolio strategies.

Figure 2: How adding ESG has affected factor strategy performance



Source: MSCI. Based on simulated data from December 2007 to June 2016.

[28] "Investing With a Conscience, but Done by a Robot," *New York Times*, April 7, 2016; http://www.nytimes.com/2016/04/07/business/dealbook/investing-with-a-conscience-but-done-by-a-robot.html; "Quants are the new ethical investors," *Financial Times,* January 23, 2016 https://www.ft.com/content/35798046-a33c-11e5-8d70-42b68cfae6e4; "The Socially Responsible Quant," Deutsche Bank, April 2013 https://www.db.com/cr/en/docs/The_Socially_Responsible_Quant.pdf

ADOPTION OF A NEW PERFORMANCE LANGUAGE

In a field replete with acronyms, one, SDGs, has quickly become part of the lexicon of long-term investors. From "No Poverty" and "Zero Hunger" through "Peace, Justice and Strong Institutions," the U.N.'s Sustainable Development Goals[29] outline a plan of action for people, the planet and prosperity that aims to transform our world.

From an investment perspective, the SDGs present a win-win proposition for institutional investors and companies. This contrasts with disclosures related to ESG risks which investors and companies do not always view the same way. Even as more companies disclose information about sustainability that affects their stakeholders, investors continue to voice frustration that companies fail to disclose on "material" ESG risk factors.[30]

Because the SDGs were not designed as a tool for corporate disclosure,[31] it comes as something of a surprise that the framework is emerging as a point of reference in companies' sustainability efforts and disclosure.[32]

MSCI ESG Research sampled companies in the MSCI ACWI Index that derive at least 20% of their revenue from products that addressed the Basic Needs theme in 2015. Of those 175 companies that met that measure as of June 2016, 161 had some form of sustainability reporting, with 41 referencing the SDGs in some way.[33]

---

[29] The U.N. adopted 17 Sustainable Development Goals were adopted by the United Nations SDGs in September 2015 as follow up to the Millennium Development Goals. For a list of the goals, see https://sustainabledevelopment.un.org/sdgs

[30] According to a survey by PwC, 92% of investors say companies are not disclosing ESG data in a way that makes it easy to compare to other companies, while 60% of companies say the data they disclose is comparable to that of other companies. The survey also highlights an inconsistency between disclosure that a majority of companies follow and the preference indicated by many investors. See "Investors, Corporates, and ESG: Bridging the Gap," PwC, http://www.pwc.com/us/en/governance-insights-center/publications/esg-environmental-social-governance-reporting.html

[31] NGOs such as the Global Reporting Initiative (https://www.globalreporting.org/Pages/default.aspx), the Carbon Disclosure Project (https://www.cdp.net/fr), International Integrated Reporting Council (http://integratedreporting.org/) and in the US the Sustainable Accounting Standards Board (www.sasb.org) have made significant progress in providing guidance to promote corporate ESG disclosure, SDGs are aspirational goals.

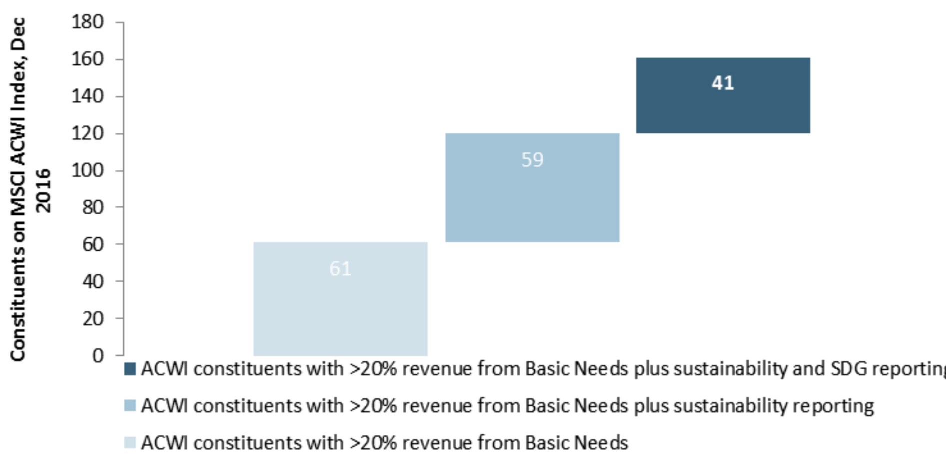
[32] A survey by the U.N. Global Compact of more than 1,000 CEOs found that 70% see the SDGs as providing a clear framework for use in structuring sustainability efforts. See https://www.unglobalcompact.org/docs/news_events/8.1/UNGC-Accenture-CEO-study-2016-infographic.pdf

[33] This compares to 102 of companies that currently reference the CDP, 90 the GRI, and 6 the SASB

While some positive outliers like Novo Nordisk[34] and Roche[35] have adopted the SDGs in a wholesale manner, most companies that reference the SDGs in reporting indicate awareness of the scope of social needs rather than any strategy to address them. Still, the referencing represents a start that promises to become increasingly important to institutional investors that aim to contribute to global stability and prosperity in the long term.[36]

Achieving the SDGs will require as much as USD 7 trillion in investment worldwide between now and 2030, according to an estimate by The United Nations Conference on Trade and Development.[37] For investors, steering investments toward companies that are working to achieve the SDGs represents one avenue to help produce positive social, environmental and economic impact. For companies, financing the SDGs will demand a shift in business models toward solutions that address such challenges. For both groups, the move to a universal language and common goals –long a challenge in sustainable investing – can help to scale impact investing in 2017 and the years to come.

Figure 3: Focus on SDGs for MSCI ACWI constituents as of December 31, 2016



Source: MSCI ESG Research, December 2016.

[34] "2030 Agenda for Sustainable Development," Novonordisk; http://www.novonordisk.com/about-novo-nordisk/novo-nordisk-in-brief/positions/2030-agenda-for-sustainable-development.html

[35] "Roche is committed to support the UN SDGs," Roche; http://www.roche.com/sustainability/our_reporting/un-sdgs.htm

[36] PGGM, UBS Wealth Management, Sonen Capital, JP Morgan, Blackrock

[37] Private Sector Investment and Sustainable Development, United Nations Global Compact, https://www.unglobalcompact.org/docs/publications/Private_Sector_Investment_and_Sustainable_Development.pdf

GREEN SHOOTS IN CHINA AND INDIA'S SUSTAINABLE FINANCE

Institutional investors worldwide have watched with equal parts optimism and skepticism as China, India and other emerging market countries launched a series of initiatives in the past two years to jump-start their transitions to low carbon economies. This could be the year that China and India become powerhouses in environmental finance, amid increasing signs that companies in those markets are choosing to adhere to global standards on sustainability in order to attract foreign capital.

The transition to a low-carbon economy will require investment of between USD 450 billion and USD 800 billion annually in renewable energy and green technologies.[38] Governments around the world, least of all in emerging economies, may not be able to afford the bill without significant investment from the private sector. This may underscore why China has made green finance a national strategy, with subsidies for loans that finance renewable energy, guidelines from the People's Bank of China (PBOC) that govern issuance of green bonds,[39] tradable environmental indexes, a national carbon trading scheme, and tax incentives and subsidies, that all lay a foundation for a green financial system.

By 2030, India is aiming to lower the emissions intensity of its gross domestic product by up to 35% compared with 2005 levels, and to quadruple renewable energy capacity in the next five years.[40] Renewable energy has been deemed a priority lending sector for banks, and the Securities and Exchange Board of India has issued voluntary green bond guidelines.[41]

Despite these efforts, Western investors that have traditionally sought out green financing opportunities have stayed away so far. The reason: caution about what counts as "green". Investors have expressed concerns around the inclusion of controversial categories such as "clean coal" and "large hydro" in the PBOC's

[38] For example, see http://www3.weforum.org/docs/WEF_GreenInvestment_Report_2013.pdf; http://unfccc.int/press/news_room/newsletter/guest_column/items/4608.php

[39] http://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/PBOC-Announcement-No-39-2015.pdf; http://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/Preparation-Instructions-on-Green-Bond-Endorsed-Project-Catalogue-2015-Edition-by-EY.pdf

[40] Ministry of New and Renewable Energy (MNRE), http://mnre.gov.in/file-manager/UserFiles/Tentative-State-wise-break-up-of-Renewable-Power-by-2022.pdf.

[41] Securities and Exchange Board of India. http://www.sebi.gov.in/cms/sebi_data/attachdocs/1449143298693.pdf

guidelines. MSCI ESG Research estimates that almost 80% of the USD 33.2 billion domestic green bond market in China would not meet our criteria because of a lack of transparency, weakness in monitoring, or questions about the types of projects being financed.[42]

Still, we see signs that the market is about to become more investable for institutional investors. Issuers are starting to hold themselves to higher standards as they work to attract foreign capital. In contrast to the Yuan-denominated domestic market that is off limits to foreign investors, all of the USD 3 billion in euro- and dollar- denominated Chinese green bonds issued in 2016 met MSCI ESG Research's criteria for inclusion in the Bloomberg Barclays MSCI Green Bond Indices[43] and constituted 4% of total investment-grade hard currency debt issued out of China in the year. In India, we found that nearly 10% of new investment-grade hard currency debt issued in 2016 met MSCI ESG Research's green bond criteria.

While we would not go so far as to claim that China will assume the mantle of global leadership in the transition to a low-carbon economy,[44] or that India will leapfrog developed markets in renewable energy,[45] the groundwork that these governments have laid on the policy front may start to pay dividends in 2017, as a convergence of domestic and global standards for what qualifies as green starts to attract foreign investment.

[42] For MSCI ESG Research's full green bond methodology and eligible project taxonomy, please contact esgclientservice@msci.com

[43] https://www.investmentbank.barclays.com/content/dam/barclayspublic/docs/investment-bank/global-insights/green-bond-benchmark-indices-bringing-clarity-to-the-green-bond-market-696kb.pdf

[44] See https://www.nrdc.org/experts/barbara-finamore/why-donald-trump-wrong-about-climate-and-china, http://www.climatecentral.org/news/trump-win-china-to-take-climate-leadership-role-20870, http://www.latimes.com/opinion/op-ed/la-oe-gardner-china-climate-leadership-20161204-story.html

[45] For example, see https://www.theguardian.com/environment/2014/oct/01/india-will-be-renewables-superpower-says-energy-minister

CONTACT US

esgclientservice@msci.com

AMERICAS

+ 1 212 804 5299

EUROPE, MIDDLE EAST & AFRICA

+ 44 20 7618 2510

ASIA PACIFIC

+ 612 9033 9339

ABOUT MSCI ESG RESEARCH PRODUCTS AND SERVICES

MSCI ESG Research products and services are provided by MSCI ESG Research LLC, and are designed to provide in-depth research, ratings and analysis of environmental, social and governance-related business practices to companies worldwide. ESG ratings, data and analysis from MSCI ESG Research LLC. are also used in the construction of the MSCI ESG Indexes. MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc.

ABOUT MSCI

For more than 40 years, MSCI's research-based indexes and analytics have helped the world's leading investors build and manage better portfolios. Clients rely on our offerings for deeper insights into the drivers of performance and risk in their portfolios, broad asset class coverage and innovative research.

Our line of products and services includes indexes, analytical models, data, real estate benchmarks and ESG research.

MSCI serves 97 of the top 100 largest money managers, according to the most recent P&I ranking.

For more information, visit us at www.msci.com.

NOTICE AND DISCLAIMER

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSCI"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Providers") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or redisseminated in whole or in part without prior written permission from MSCI.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC. and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of www.msci.com.

MSCI ESG Research LLC. is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable products or services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials may include MSCI Inc., clients of MSCI or suppliers to MSCI, and may also purchase research or other products or services from MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD, FEA, InvestorForce, and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor's. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and Standard & Poor's.